REMARKS

These remarks address the Examiner's comments made in the Office Action mailed 02/21/2007. Applicant's attorney inadvertently failed to respond to that Office Action in a timely manner, a Notice of Abandonment was mailed 09/25/2007, and a Petition to Revive is filed herewith.

1) Withdrawn Claims

Upon the allowance of a generic claim, Applicant requests revival of the withdrawn claims.

2) Rejection over Yamamuro

Summary: Yamamura's lamination is in the wrong direction, and his layers are not electrically insulated.

Figure 7 of Yamamuro does indeed show a laminated structure in his pole plate and top plate. However, the lamination extends in precisely the wrong direction to accomplish the claimed result of Applicant's invention. Yamamuro's analysis is grossly incorrect. The magnetic flux shown in his Figure 3 is the magnetic flux caused directly by the voice coil, which we may term the "coil flux" for convenience. Distortion is not caused by the coil flux. And although the voice coil current directly causes heating of the voice coil, neither the voice coil current nor the coil flux magnetic causes heating of the other motor components of the motor.

Rather, the coil flux induces eddy currents in nearby electrically conductive motor components such as pole plates, pole pieces, and top plates (all of which are conventionally made of non-laminated steel). The eddy currents flow in the circular direction shown in Applicant's FIG. 15 (labeled "EC"). It is these eddy currents which heat the motor components. And it is the magnetic flux generated by the eddy currents which fights the coil flux to cause distortion.

Laminating motor components in the only orientation taught by Yamamuro does not have any meaningful impact on the eddy currents, because the lamination boundaries (which break the electrical conductivity of paths passing through them) are in exactly the wrong orientation – perpendicular to the axis of movement of the voice coil. Envision a combination of the teachings

of Applicant's FIG. 15 with Yamamura's Figure 7 – in essence merely adding the "EC" arrows to each of the lamination layers of Yamamura's motor. That clearly demonstrates that each of his steel layers will still have a complete circular path of electrical conductivity around the axis of the motor, in each of his steel layers. The boundaries between Yamamura's laminated steel layers are perpendicular to the axis of movement of the voice coil. (Furthermore, Yamamura teaches (col. 3 lines 17-20) that the layers between the steel can optionally be electrically conductive. And it is particularly instructive that Yamamura repeatedly refers to his magnetic circuit components as being "magnetically anisotropic" not "electrically anisotropic".)

This is in stark contrast to the orientation of lamination taught in Applicant's disclosure. Applicant's invention separates (insulates) the laminated steel layers along boundaries that are substantially parallel to the axis of the voice coil. As shown in FIG. 16, the boundaries between layers 306, and the boundaries between layers 304, are both oriented vertically, as is the voice coil's axis (clearly identified by the vertical orientation of the cylinder of the magnetic air gap 18). This is also true of the boundaries between layers 312 and of the boundaries between layers 316 in FIG. 17, and of the boundaries between layers 326 and of the boundaries between layers 324 in FIG. 18, and of the boundaries between layers 332 in FIG. 19, and so forth.

Yamamura's motor simply does not function to reduce or eliminate eddy currents in the electrically conductive (steel etc.) components of his motor, because his lamination is in the wrong direction.

Applicant believes that this distinction was already clearly included in most or all of the Claims, but has amended all the independent Claims to even more clearly and expressly so indicate.

Claim 1 has been amended to expressly recite that "the laminated layer sections are separated along boundaries which are substantially parallel to the axis [of the motor assembly]".

Claim 5 has been amended to expressly recite that "the magnetically conductive sections are electrically insulated from each other along boundaries substantially parallel to the axis of the voice coil".

Claim 10 has been amended to expressly recite that "the multiple components are laminated at boundaries substantially parallel to an axis of the electromagnetic motor structure".

And Claim 41 has been amended to expressly recite that "eddy currents induced by the voice coil are interrupted at boundaries between adjoining ones of the magnetically conductive sections, wherein the boundaries are substantially parallel to an axis of movement of the voice coil."

Applicant believes that these amendments are more than sufficient to overcome the rejection, but will address each of the rejected claims in turn.

Claim 1: The office action states that Yamamura teaches that his laminated layer sections are "magnetically coupled to but electrically insulated from each other (9 – magnetic, 10 – insulated). Applicant submits that this indicates a slight but significant misreading of the Yamamura patent, albeit one which appears to be caused by the patent's poor English translation. The only place where the string "insul" appears in Yamamura is in this passage:

> "When using the laminated parts as shown in FIG. 7, an insulated or conductive lamination 10 may be positioned between sheets of the normal magnetic material. When the insulated lamination 10 is used, the eddy current power loss decreases and the magnetic flux acts to good advantage, and thus an electro-acoustic converter having a high conversion efficiency may be manufactured without difficulty. When the lamination 10 is conductive, the conductive laminations act as short rings, and thus the distortion is reduced more than with only the magnetically anisotropic material." (emphasis added)

The scientifically accurate reading of this passage indicates that in both instances the word "insulated" should more correctly be "electrically non-conductive". The layers labeled 9 are "normal magnetic material" (col. 3 lines 15-16). The layers labeled 10 are either electrically conductive or electrically non-conductive, as understood from that paragraph taken as a whole.

If the layers 10 are electrically conductive (e.g. copper), they act as shorting rings, and serve to sink eddy currents induced (in the circular direction around the voice coil axis), but not to reduce or eliminate them. Thermal heating will be reduced as compared to the steel-only conventional motor (because the shorting rings have lower electrical resistance than the steel), but distortion caused by flux modulation will not be reduced (because the eddy currents have only been moved from the steel to the shorting rings) and may in fact be worsened (because the

eddy currents in the shorting rings may in fact have higher current than eddy currents in the steel, and thus generate greater flux to modulate the primary motor flux). Yamamura is at least partially correct on this count.

If the layers are electrically non-conductive, they do not serve as shorting rings and, because they extend in exactly the wrong direction (to wit, the steel still provides circular, electrically conductive paths around the axis of the voice coil), eddy current power losses will not decrease – Yamamura is simply wrong on this count.

Claim 1 distinguishes over Yamamura by reciting that "the laminated layer sections are separated along boundaries which are substantially parallel to the axis" of the motor assembly, whereas Yamamura's lamination boundaries are perpendicular to the axis of his motor assembly.

Claim 2: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 5: The Office Action asserts that Yamamura's "magnetically conductive sections are mechanically coupled together and electrically insulated from each other to prevent eddy currents (9 – magnet, 10 – insulated)". This is incorrect as explained above with respect to Claim 1. Claim 5 distinguishes over Yamamura by reciting that "the magnetically conductive sections are electrically insulated from each other along boundaries substantially parallel to the axis of the voice coil", whereas in Yamamura the boundaries are perpendicular to the axis.

Claim 6: distinguishes over Yamamura by including the limitations of Claim 5.

Claim 10: The Office Action asserts that Yamamura's top plate or yoke is "comprised of multiple components laminated together so as to be electrically insulated from each other (9 – magnet, 10 – insulated)" etc.. This is incorrect as explained above with respect to Claim 1. Claim 10 distinguishes over Yamamura by reciting that "the multiple components are laminated at boundaries substantially parallel to an axis of the electromagnetic motor structure", whereas in Yamamura the boundaries are perpendicular to the axis.

Claim 12: distinguishes over Yamamura by including the limitations of Claim 10.

Claim 13: distinguishes over Yamamura by including the limitations of Claim 10.

Claim 37: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 39: distinguishes over Yamamura by including the limitations of Claim 5.

Claim 41: The Office Action asserts that Yamamura teaches "substantially preventing eddy current ... by virtue of ... a laminated structure of electrically insulated magnetically conductive sections". This is incorrect as explained above with respect to Claim 1. Claim 41 distinguishes over Yamamura by reciting that "eddy currents induced by the voice coil are interrupted at boundaries between adjoining ones of the magnetically conductive sections, wherein the boundaries are substantially parallel to an axis of movement of the voice coil", whereas in Yamamura the boundaries are perpendicular to the axis.

3) Rejection over Yamamuro and Zuerker

Zuerker is introduced to show internal magnet motor structures, whereas Yamamura only shows an external magnet motor structure.

Applicant respectfully submits that combining Yamamura and Zuerker produces an internal or external magnet motor structure in which the lamination is in exactly the wrong direction and, therefore, does not reduce or eliminate eddy current heating and does not reduce or eliminate flux modulation.

Claim 8: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 19: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 20: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 21: distinguishes over Yamamura by including the limitations of Claim 1.

Claim 22: distinguishes over Yamamura by including the limitations of Claim 1.

4) Allowance of Claims

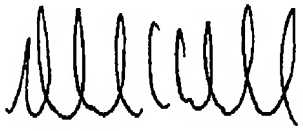
Claims 4 and 11 have been indicated as objected to but allowable if rewritten in independent form. Claim 4 specifies a wedge shape, and Claim 11 specifies one of a flat shape and a wedge shape, for the lamination layer sections or components.

Applicant sincerely thanks the Examiner for this indication, but, in light of the remarks above, declines to make such amendment at this time.

CONCLUSION

Applicant respectfully submits that the cited art neither anticipates nor makes obvious the claimed invention, and requests allowance of all claims. Further, applicant submits that: Claim 1 is generic, and thus withdrawn Claims 3, 14-18, 23-36, 38 should be revived and allowed; Claim 5 is generic, and thus withdrawn Claims 7, 9, 40 should be revived and allowed; Claim 10 is generic; and Claim 41 is generic, and thus claim 42 should be revived and allowed.

Respectfully submitted,



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